ORDER NO. MD9707075C2

Service Manual

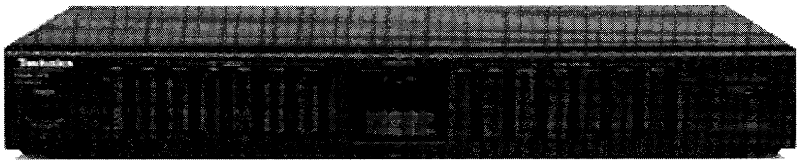
Stereo Graphic Equalizer

Equalizer

SH-GE50

Colour

(K) . . . . . Black Type



Area

Suffix for Model No.	Area	Colour
(E)	Europe	(K)
(EB)	Great Britain	
(EG)	Germany and Italy	

■ Specifications

■ Equalizer Section

Frequency response(center position)	5Hz~100kHz, -3dB
Maximum output voltage	6V(1kHz)
Rated output voltage	1V
Rated total harmonic distortion	0.007%(20Hz~20kHz)
	0.005%(1kHz)
Input sensitivity	1V
Signal -to -noise ratio	110dB(IHF'A)
Maximum input voltage	6V
Input impedence	33 kΩ
Gain	0±1 dB
Band level controls	+12dB to -12dB
	(7 continuous variable elements per channel)
Center frequency	63Hz, 160Hz, 400Hz, 1kHz
	2.5kHz, 6.3kHz, 16kHz

■ General

Power supply	AC 230 - 240 V, 50 Hz
Power consumption	11W
Dimensions (W x H x D)	430 x 80.4 x 192.5 mm
	($16^{29}/_{32}$" x $3^{5}/_{32}$" x $7^{19}/_{32}$")
Weight	1.8kg (3.95lb.)

Notes :

1. Specifications are subject to change without notice. Weight and dimensions are approximate.
2. Total harmonic distortion is measured by the digital spectrum analyzer.

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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■ Caution for AC Main Leads

(For "EB" area code model only.)

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.
A 5-ampere fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark ⟨ASTA⟩ or the BSI mark ⟨BSI⟩ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover, the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local dealer.

CAUTION !
IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OFF SAFELY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted, please observe the wiring code as shown below.
If in any doubt please consult a qualified electrician.

IMPORTANT
The wires in this mains lead are coloured in accordance with the following code:

Blue:	Neutral
Brown:	Live

As these colours may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured Black or Blue.

The wire which is coloured Brown must be connected to the terminal which is marked with the letter L or coloured Brown or Red.

WARNING: DO NOT CONNECT EITHER WIRE TO THE EARTH TERMINAL WHICH IS MARKED WITH THE LETTER E, BY THE EARTH SYMBOL ⏚ OR COLOURED GREEN OR GREEN/YELLOW.

THIS PLUG IS NOT WATERPROOF—KEEP DRY.

Before use
Remove the connector cover.

How to replace the fuse
The location of the fuse differ according to the type of AC mains plug (figures A and B). Confirm the AC mains plug fitted and follow the instructions below.
Illustrations may differ from actual AC mains plug.

1. Open the fuse cover with a screwdriver.

Figure A

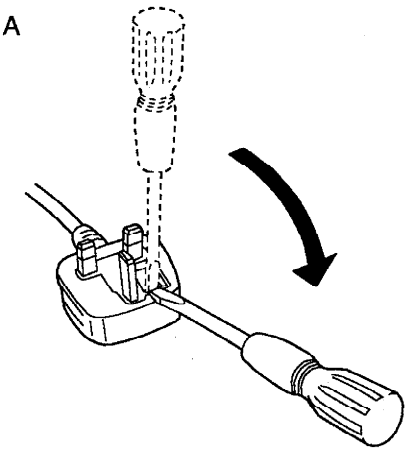
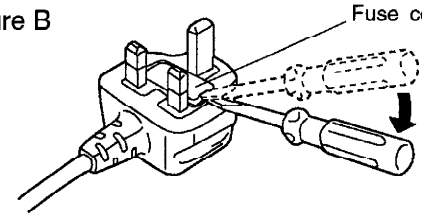


Figure B



2. Replace the fuse and close or attach the fuse cover.

Figure A

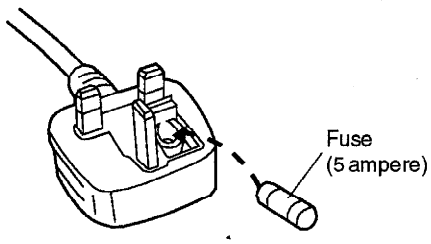
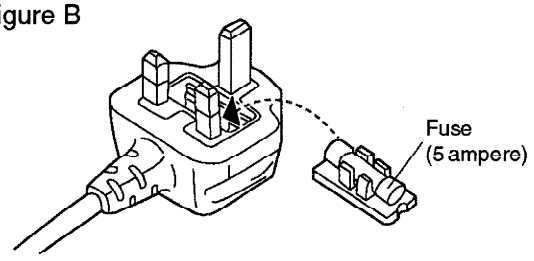


Figure B



■ Operation Checks

"ATTENTION SERVICER" Some chassis components may have sharpe edges. Be careful when disassembling and serving.

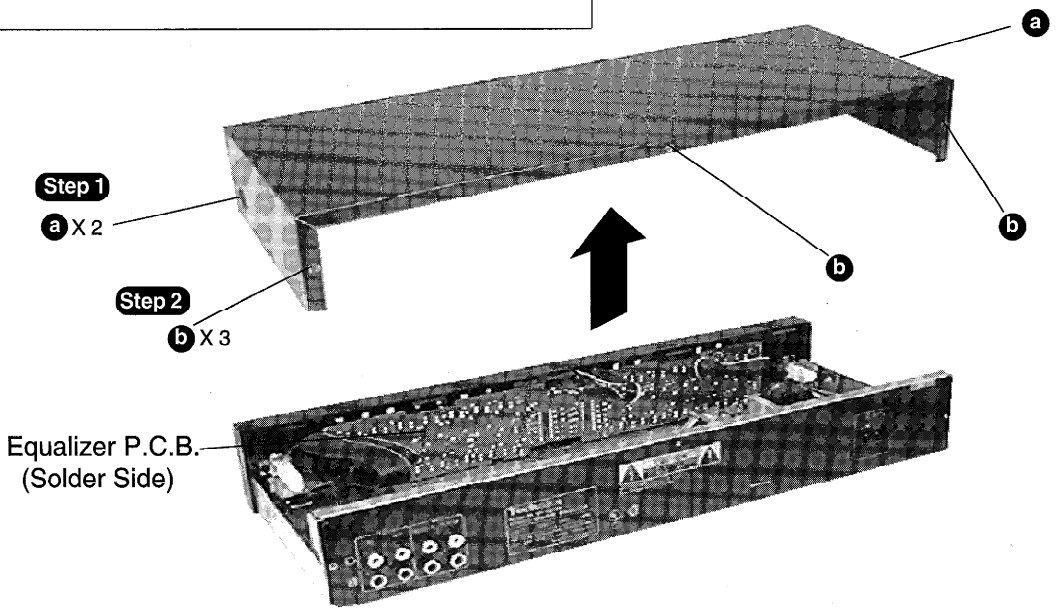
1. This section describes procedures for checking the operation of the major printed circuit boards .
2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
3. Select items from the following index when checks or replacement are required.

• Contents

page
• Checking Procedure for Major P.C.B. ..... 3 ~ 4

■ Checking Procedure for Major P.C.B.

1. Checking of the Equalizer P.C.B.



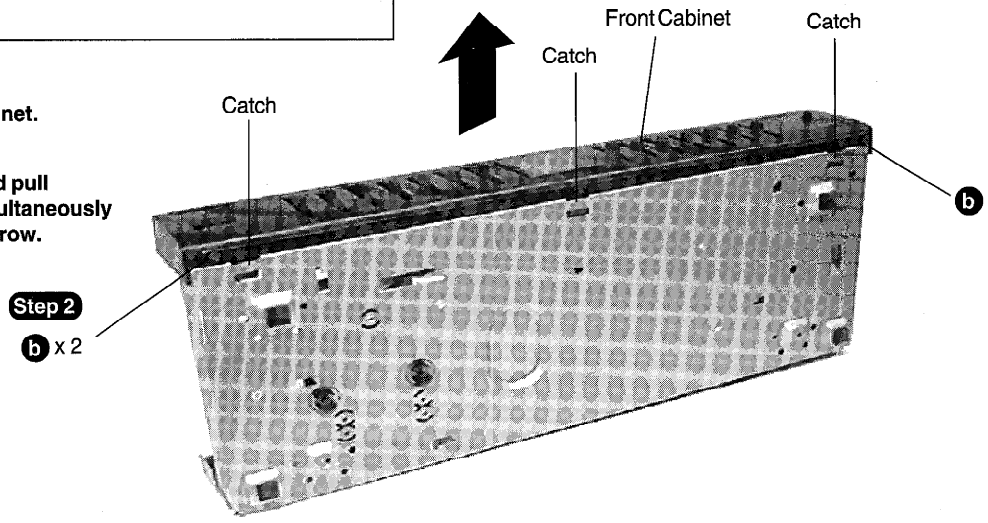
a [SNE2129-1] (Black)

b [XTBS3+8JFZ1] (Black)

2. To remove the front panel from bottom chassis

Step 1
Remove the top cabinet.

Step 3
Push the 3 catch and pull the frontcabinet simultaneously in the direction of arrow.

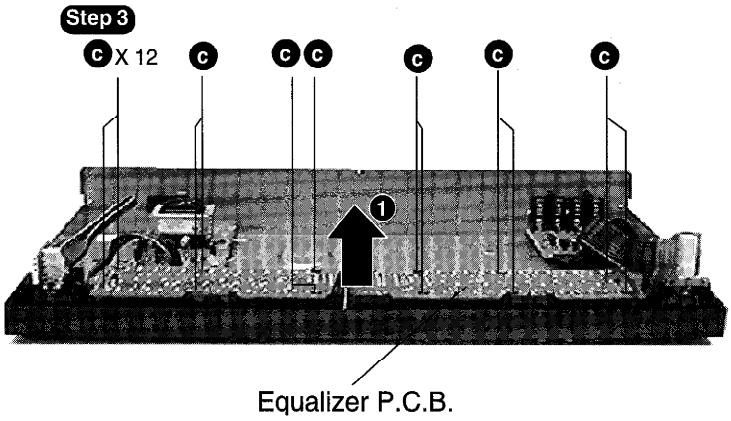


3. To remove Equalizer P.C.B.

Step 1
Remove the top cabinet.

Step 2
Remove the front cabinet.

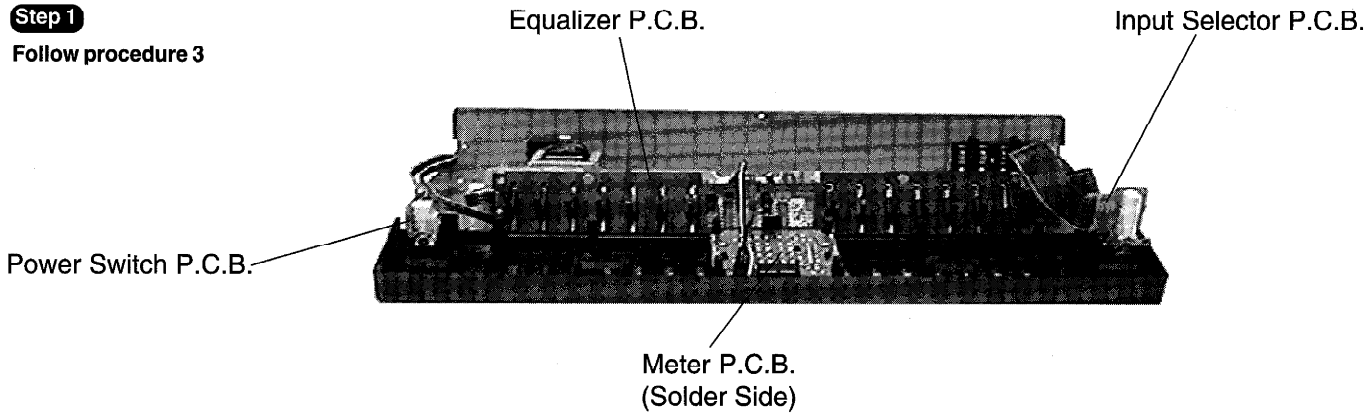
Step 4
Remove the Equalizer P.C.B. in the direction of arrow ❶



c [XTBS26+10J]

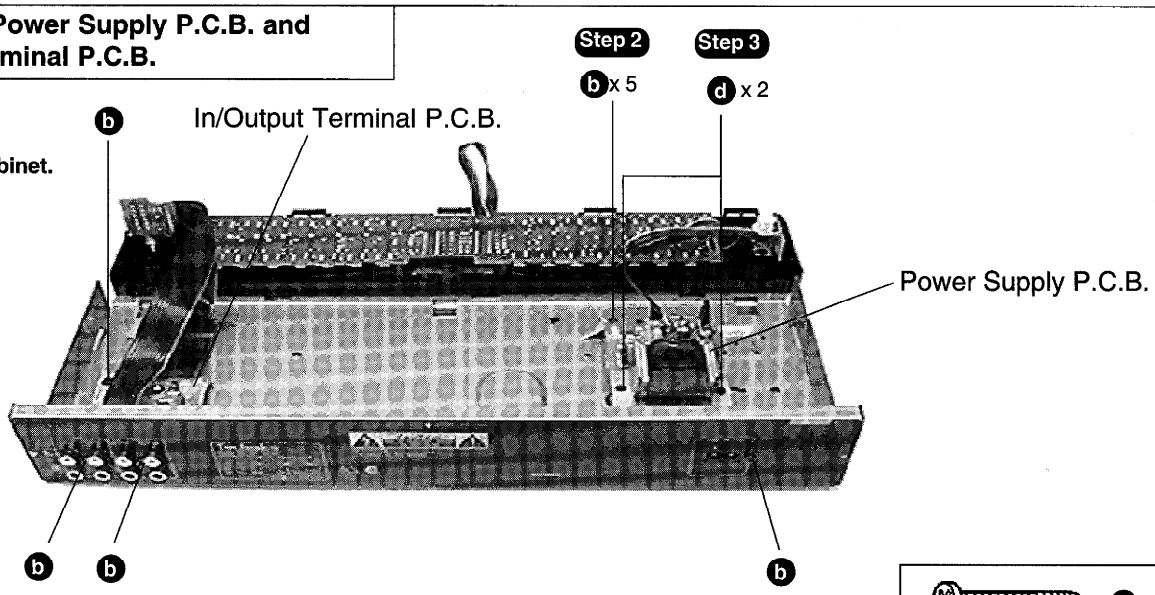
4. Checking of Input Selector P.C.B., Meter P.C.B. and Power Switch P.C.B.

Step 1
Follow procedure 3



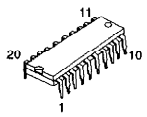
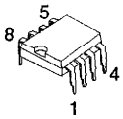
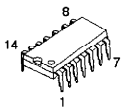
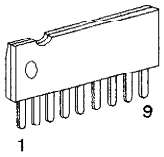
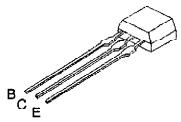
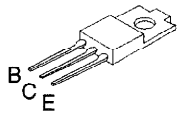
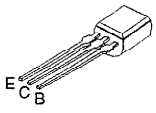
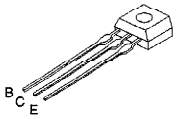
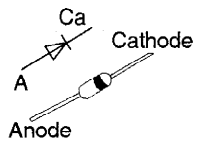
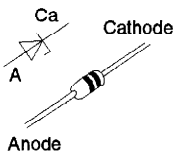
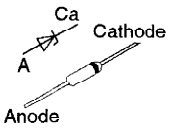
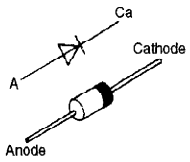
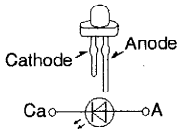
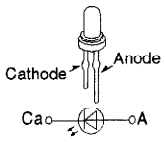
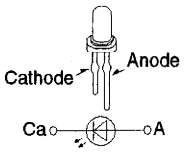
5. Checking of Power Supply P.C.B. and In/Output Terminal P.C.B.

Step 1
Remove the top cabinet.



d [XTB3+20JFZ] (Black)

■ Terminal Guide of ICs, Transistors and Diodes

M5229P 	M5218AP 	MLC4066BH 	BA6144 	RVTDTC143XST 2SA933SSTA 2SC1740SSTA 	2SD2374PQAU 
2SB621AQSTA 	2SD1915FTA 	MA165TA 	MA2110BLF 	MTZJ13BTA 	RL1N4003NO2 
SLR325MCT31 SLR325YCT31 	SLR342VC 	SLA370LT SLA370MT 			

■ Schematic Diagram

(All schematic diagrams may be modified at any time with the development of new technology)

Note :

- **S1** : Power switch
- **S201** : Input Selector switch
- **VR201 & VR202** : Equaliser control (63Hz)
- **VR203 & VR204** : Equaliser control (1 60Hz)
- **VR205 & VR206** : Equaliser control (400Hz)
- **VR207 & VR208** : Equaliser control (1kHz)
- **VR209 & VR2010** : Equaliser control (2.5kHz)
- **VR2011 & VR2012** : Equaliser control (6.3kHz)
- **VR2013 & VR2014** : Equaliser control (16kHz)

• Signal line

: +B line

: -B line

: Main signal line

: Playback signal line

: Record signal line

•The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.

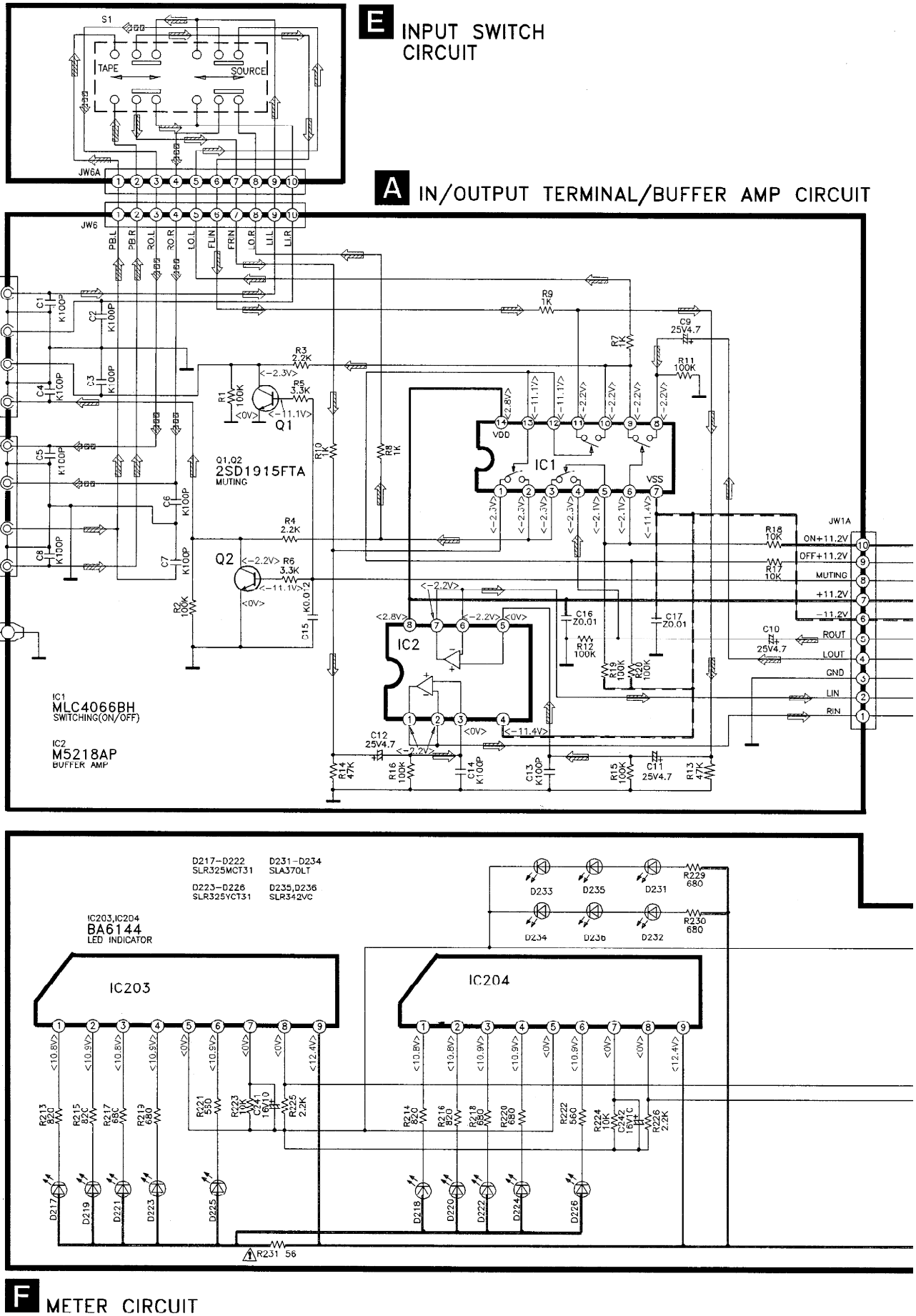
•Importance safety notice:

Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

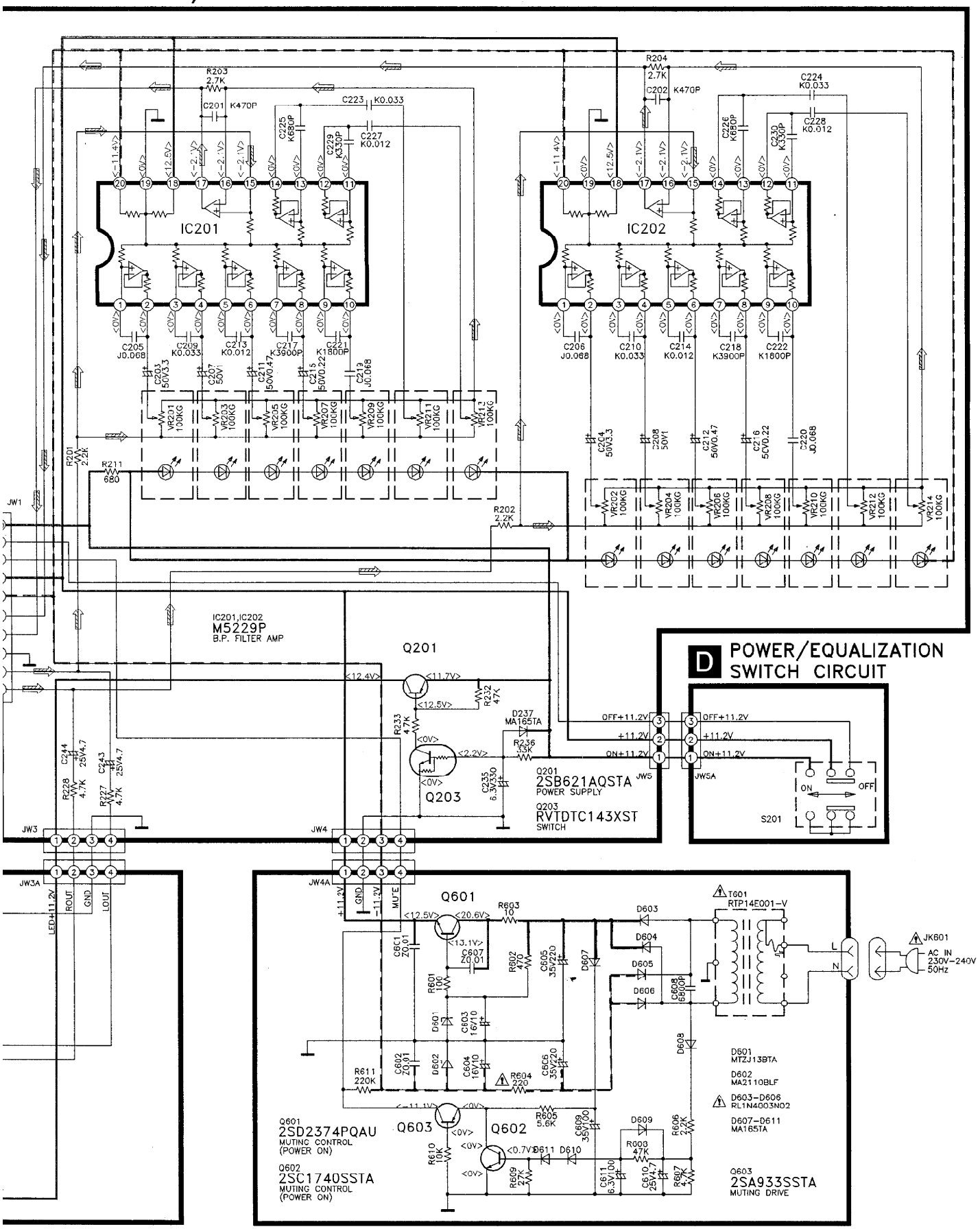
Caution !

IC, LSI and VLSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
•Cover the parts boxes made of plastics with aluminium foil.
•Ground the soldering iron.
•Do not touch the pins of IC, LSI or VLSI with fingers directly.
•Put a conductive mat on the work table.

■ Schematic Diagram

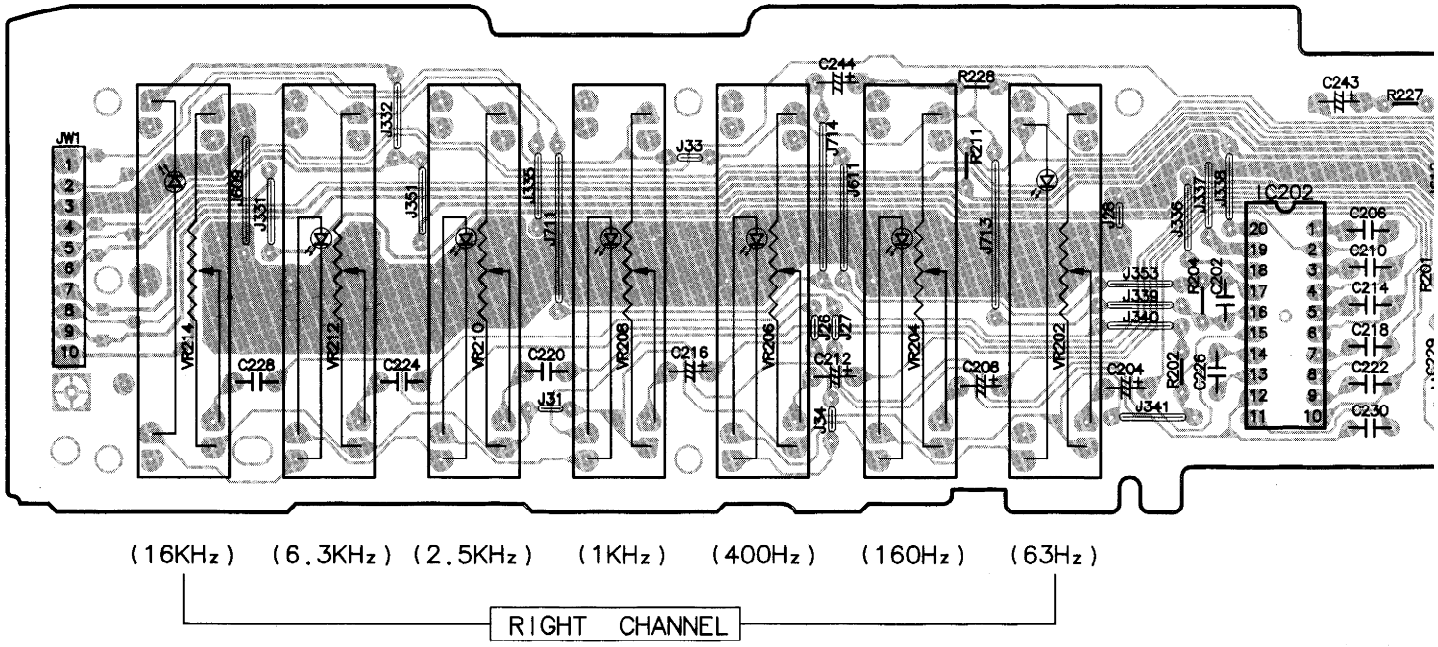


C B.P FILTER AMP/BAND LEVEL CONTROLS CIRCUIT

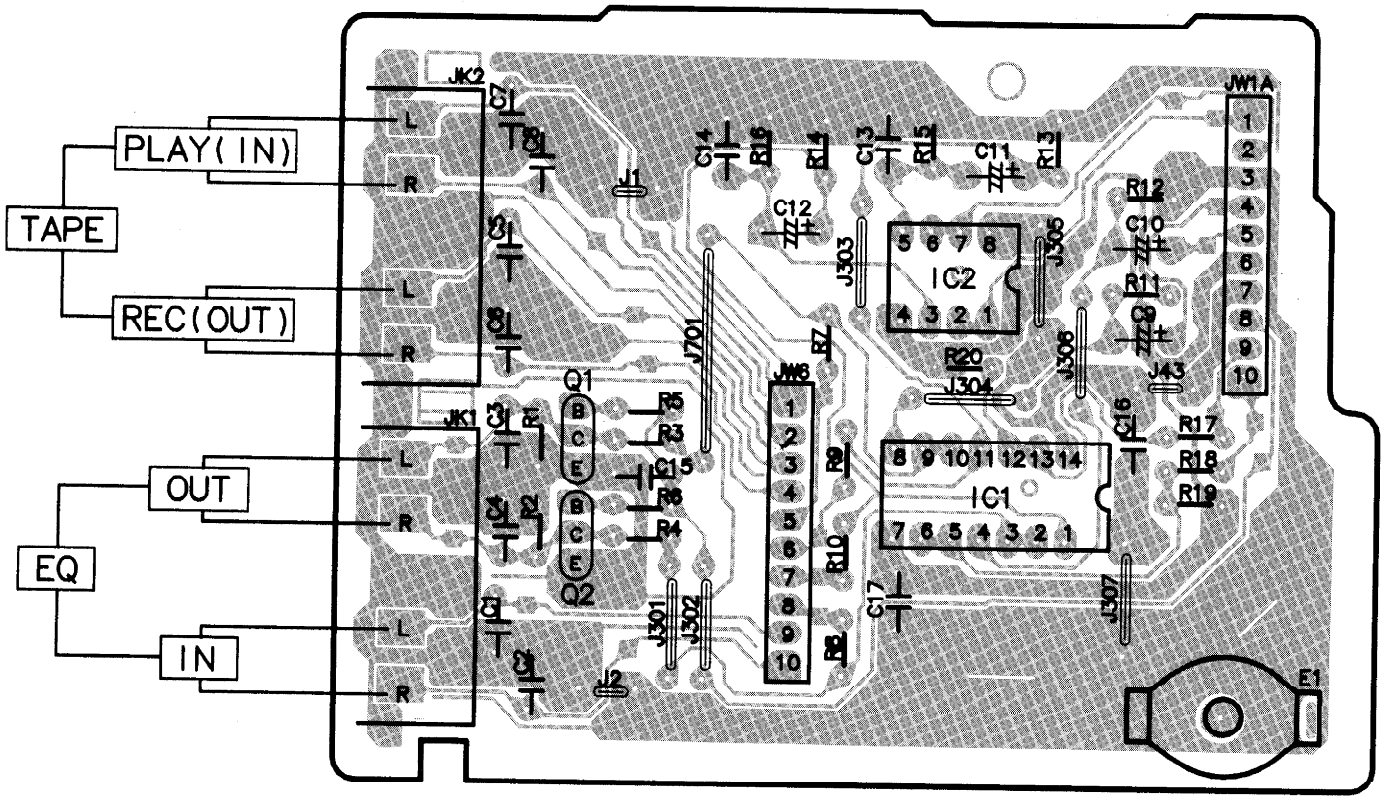


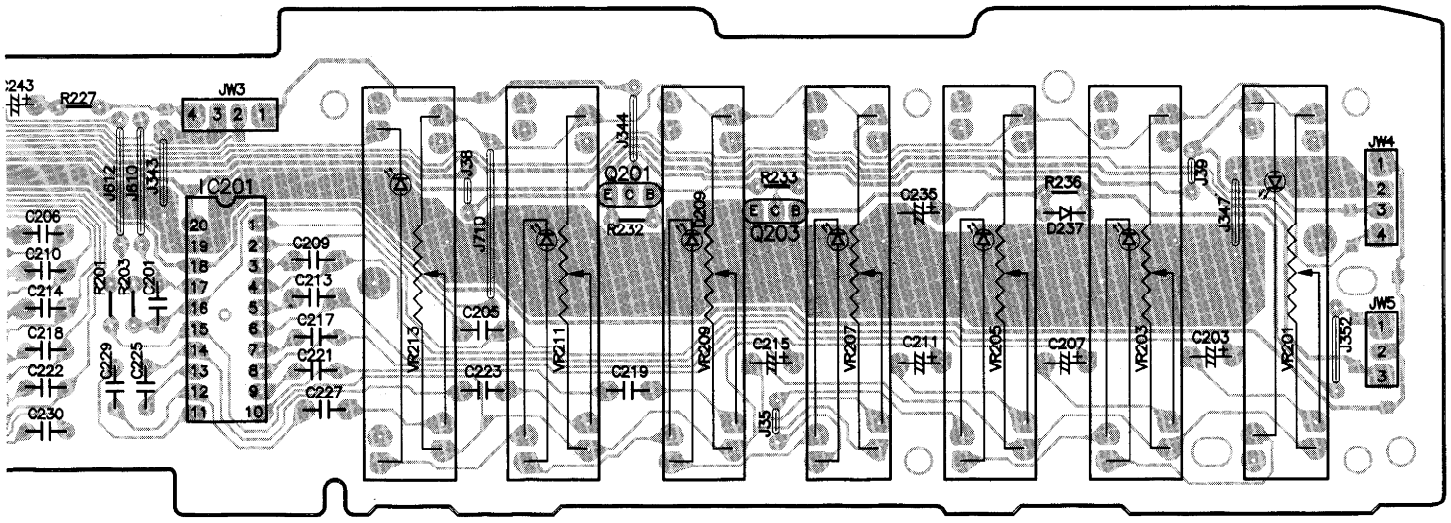
■ Printed Circuit Board

C B.P FILTER AMP/BMP BAND LEVEL CONTROLS P.C.B. (REP2485C-M)



A IN/OUTPUT TERMINAL/BUFFER AMP P.C.B. (REP2485C-M)

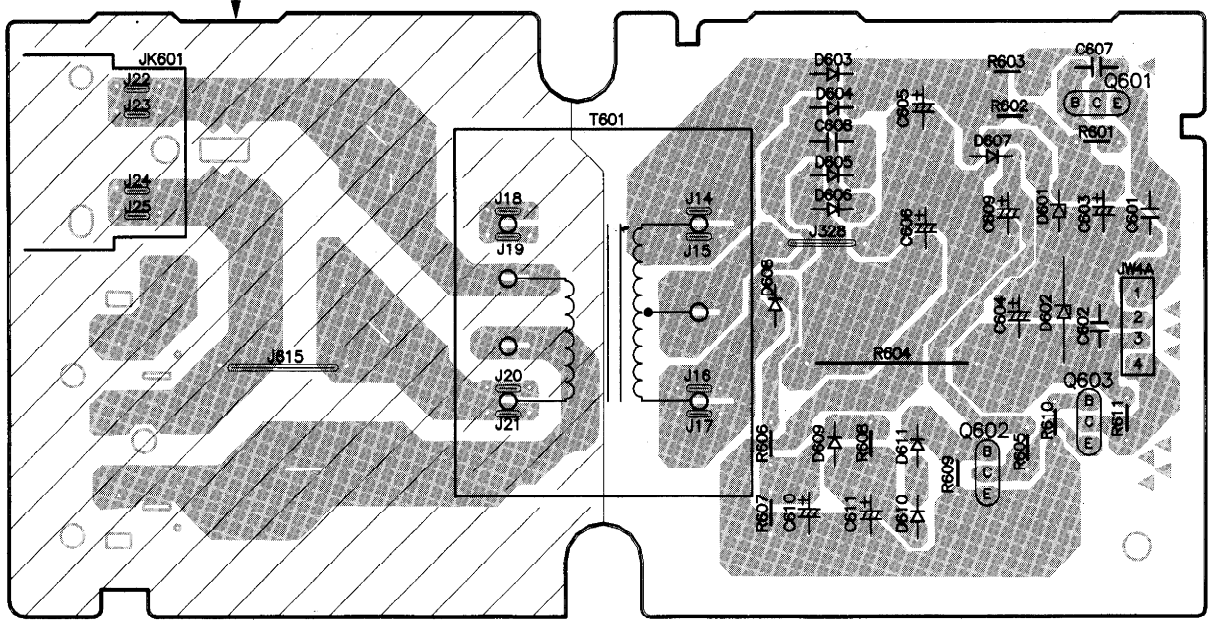




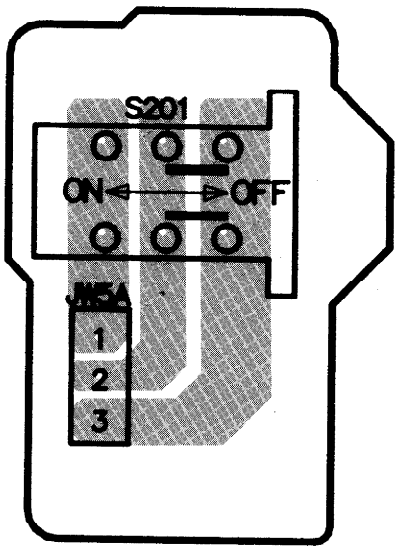
B POWER P.C.B. (REP2485C-M)

CAUTION
RISK OF ELECTRIC SHOCK
AC voltage line. Please do not touch this portion.

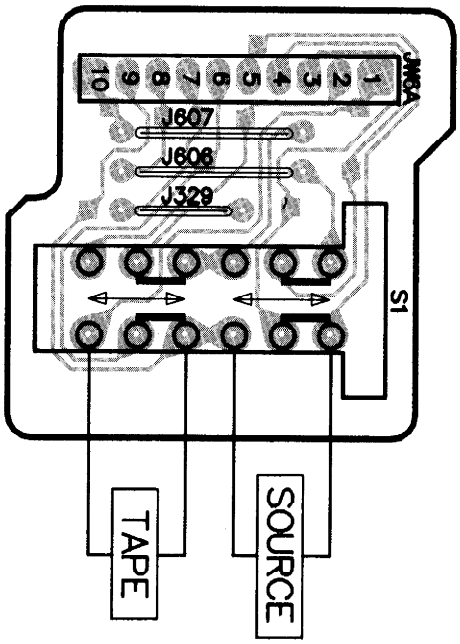
AC IN ~
230V–240V
50Hz



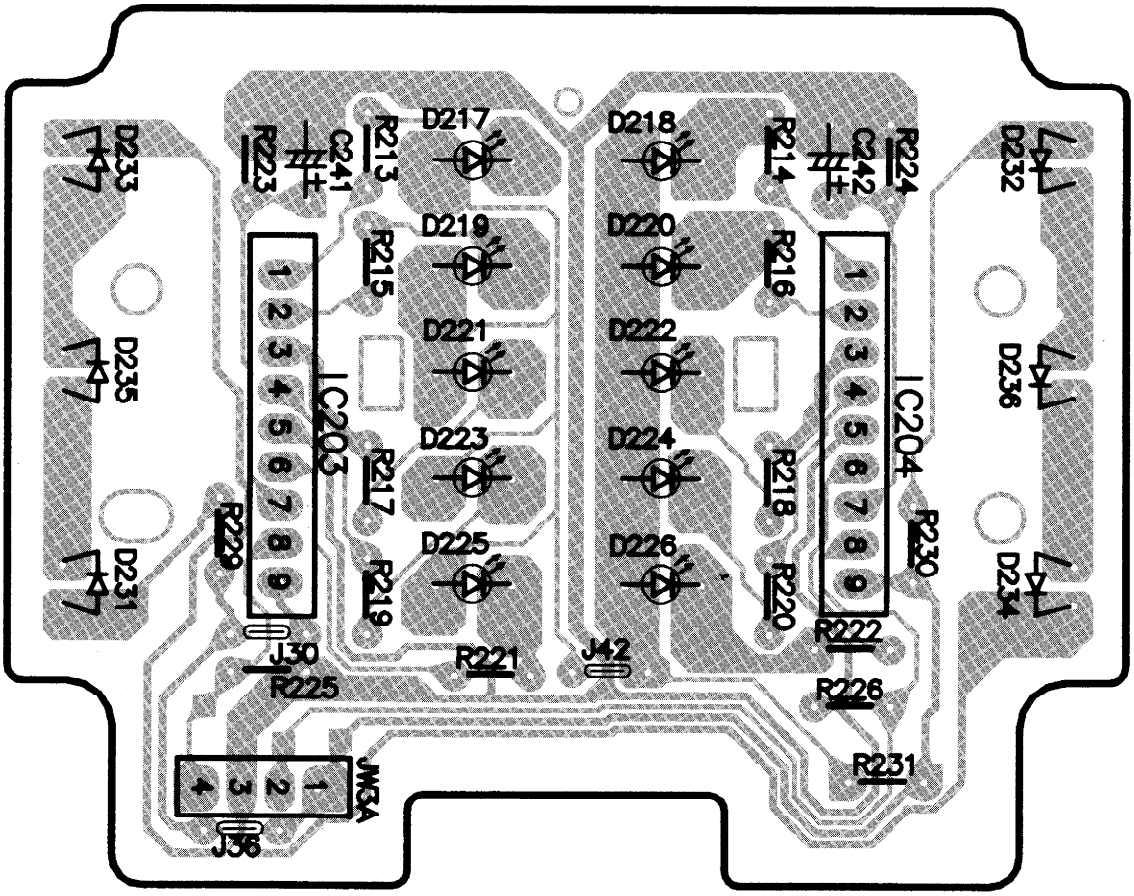
D POWER/EQUALIZATION SWITCH P.C.B. (REP2485C-M)



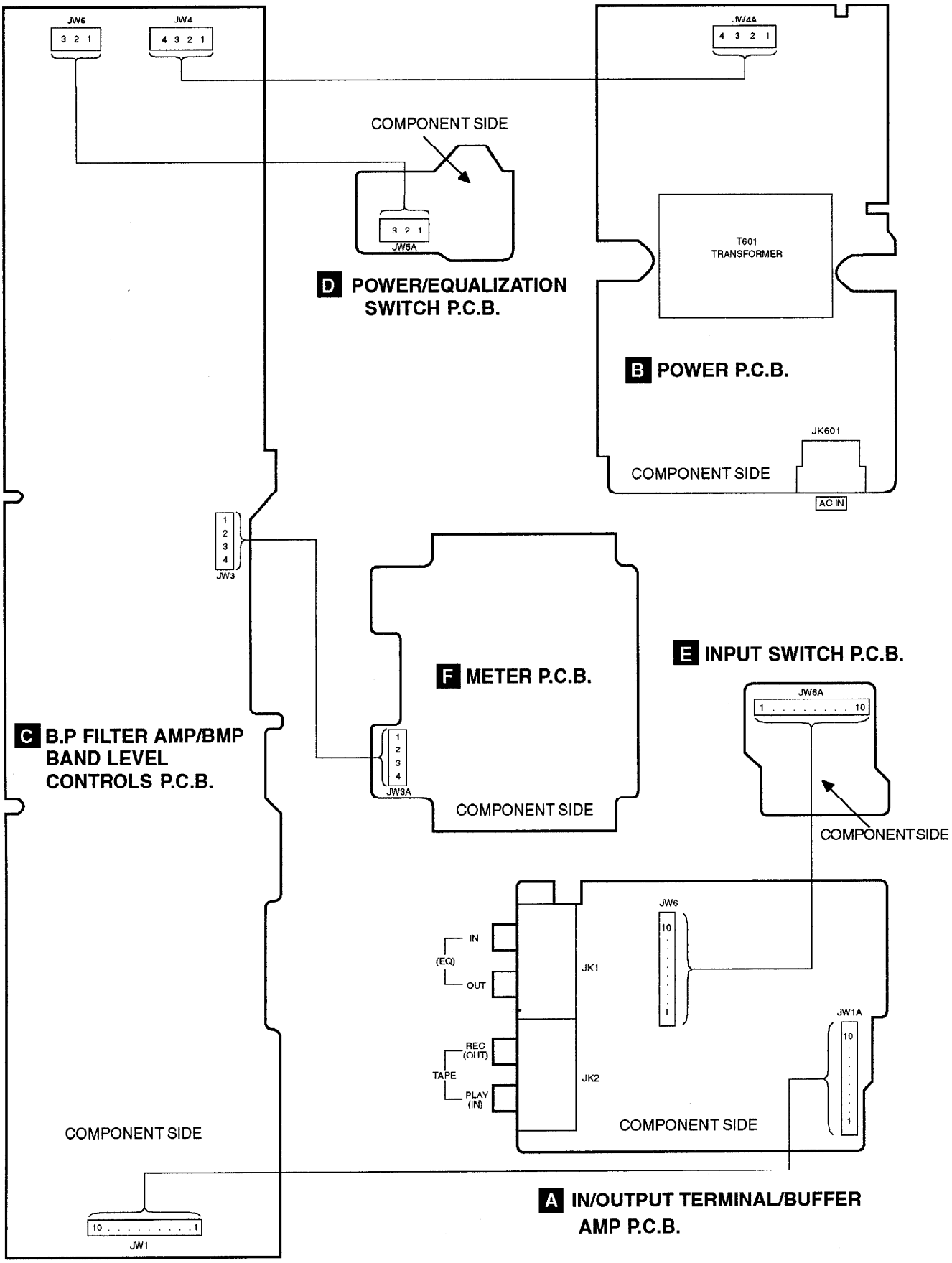
E INPUT SWITCH P.C.B. (REP2485C-M)



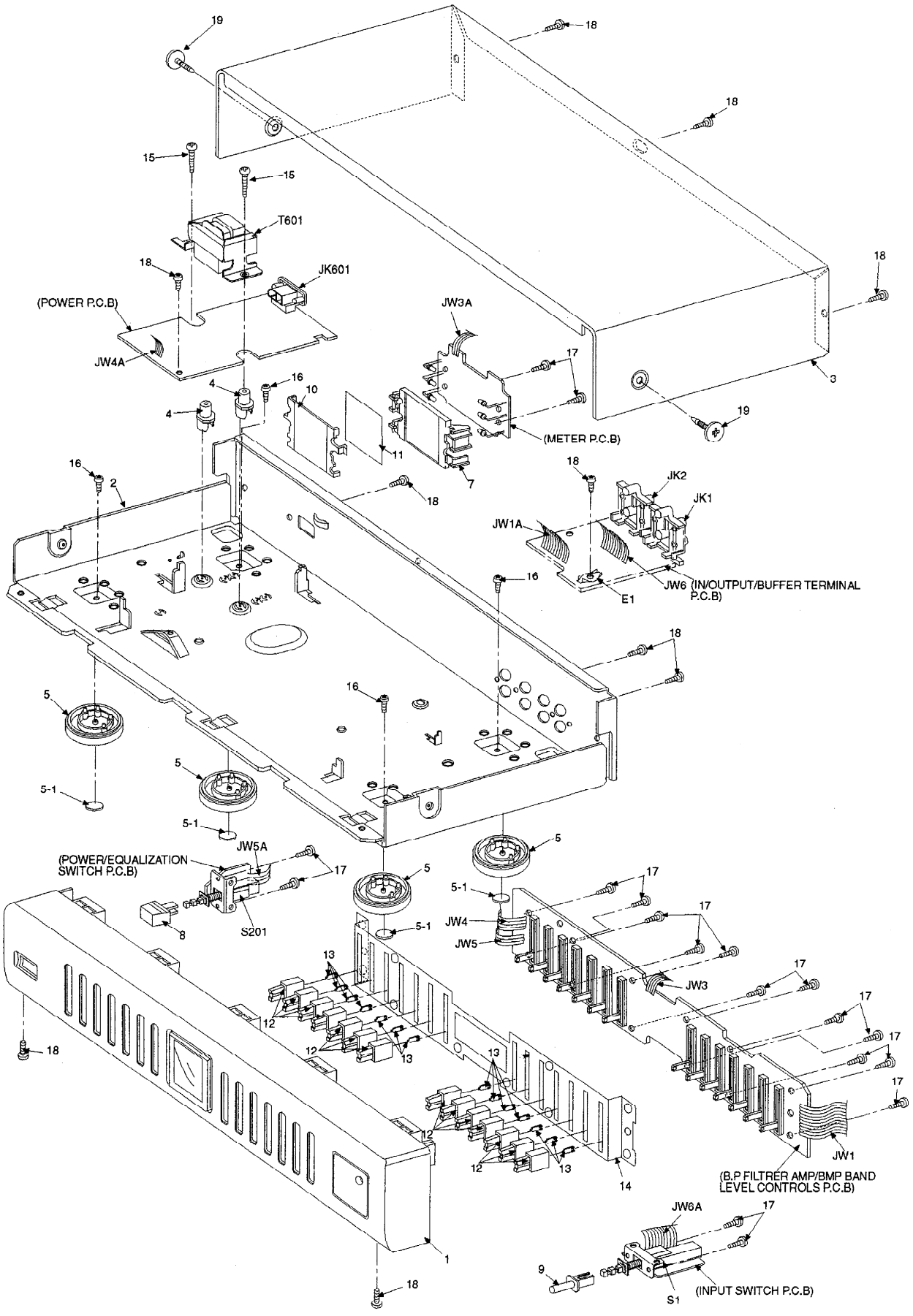
F METER P.C.B. (REP2485C-M)



■ Wiring Connection Diagram



■ Cabinet Parts Location



■ Replacement Parts List

Notes: * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
* [M] in Remarks column indicates parts that are supplied by **MESA**.

Ref No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RFKGHGE50EK	FRONT PANEL ASS'Y	[M]
2	SGPK420-7B	BOTTOM CHASSIS	[M]EG E
2	SGPK420-7C	BOTTOM CHASSIS	[M]EB
3	SKCK200K99	TOP CABINET	[M]
4	RKQ0089-J	PCB HOLDER	[M]
5	RKA0079-A	LEG	[M]
5-1	RMG0270-K	LEG CUSHION	[M]
7	RMN0433	LED CASE	[M]
8	RGU0890-K	POWER BUTTON	[M]
9	RGU1390-K	VCR2 BUTTON	[M]
10	RGL0361-Q	LIGHT GUIDE	[M]
11	RKW0509-K	LED SHEET	[M]
12	SBWK27	VOLUME KNOB	[M]
13	SBZK33	LIGHT GUIDE	[M]
14	RMF0248	BLIND SHEET	[M]
15	XTB3+20JFZ	SCREW	[M]
16	XTB3+6G	SCREW (FOOT)	[M]
17	XTBS26+10J	SCREW (FRONT)	[M]
18	XTBS3+8JFZ1	SCREW	[M]
19	SNE2129-1	SCREW (CABINET)	[M]
		INTEGRATED CIRCUITS	
IC1	MLC4066BH	IC, EQ	[M]
IC2	M5218AP	IC, BUFFER AMP	[M]
IC201	M5229P	IC, FILTER	[M]
IC202	M5229P	IC, FILTER	[M]
IC203	BA6144	IC, MASTER	[M]
IC204	BA6144	IC, MASTER	[M]
		TRANSISTORS	
Q1	2SD1915FTA	TRANSISTOR	[M]
Q2	2SD1915FTA	TRANSISTOR	[M]
Q201	2SB621AQSTA	TRANSISTOR	[M]
Q203	RVTDTC143XST	TRANSISTOR	[M]
Q601	2SD2374PQAU	TRANSISTOR	[M]
Q602	2SC1740SSTA	TRANSISTOR	[M]
Q603	2SA933SSTA	TRANSISTOR	[M]

Ref No.	Part No.	Part Name & Description	Remarks
		DIODES	
D217	SLR325MCT31	DIODE	[M]
D218	SLR325MCT31	DIODE	[M]
D219	SLR325MCT31	DIODE	[M]
D220	SLR325MCT31	DIODE	[M]
D221	SLR325MCT31	DIODE	[M]
D222	SLR325MCT31	DIODE	[M]
D223	SLR325YCT31	DIODE	[M]
D224	SLR325YCT31	DIODE	[M]
D225	SLR325YCT31	DIODE	[M]
D226	SLR325YCT31	DIODE	[M]
D231	SLA370LT	DIODE	[M]
D232	SLA370MT	DIODE	[M]
D233	SLA370MT	DIODE	[M]
D234	SLA370LT	DIODE	[M]
D235	SLR342VC	DIODE	[M]
D236	SLR342VC	DIODE	[M]
D237	MA165TA	DIODE	[M]
D601	MTZJ13BTA	DIODE	[M]
D602	MA2110BLF	DIODE	[M]
D603	RL1N4003N02	DIODE	[M] ⚠
D604	RL1N4003N02	DIODE	[M] ⚠
D605	RL1N4003N02	DIODE	[M] ⚠
D606	RL1N4003N02	DIODE	[M] ⚠
D607	MA165TA	DIODE	[M]
D608	MA165TA	DIODE	[M]
D609	MA165TA	DIODE	[M]
D610	MA165TA	DIODE	[M]
D611	MA165TA	DIODE	[M]
		VARIABLE RESISTORS	
VR201	EWANW0J15G15	VARIABLE RESISTOR	[M]
VR202	EWANW0J15G15	VARIABLE RESISTOR	[M]
VR203	EWANW0J15G15	VARIABLE RESISTOR	[M]
VR204	EWANW0J15G15	VARIABLE RESISTOR	[M]
VR205	EWANW0J15G15	VARIABLE RESISTOR	[M]
VR206	EWANW0J15G15	VARIABLE RESISTOR	[M]
VR207	EWANW0J15G15	VARIABLE RESISTOR	[M]
VR208	EWANW0J15G15	VARIABLE RESISTOR	[M]
VR209	EWANW0J15G15	VARIABLE RESISTOR	[M]

Ref No.	Part No.	Part Name & Description	Remarks
VR210	EWANW0J15G15	VARIABLE RESISTOR	[M]
VR211	EWANW0J15G15	VARIABLE RESISTOR	[M]
VR212	EWANW0J15G15	VARIABLE RESISTOR	[M]
VR213	EWANW0J15G15	VARIABLE RESISTOR	[M]
VR214	EWANW0J15G15	VARIABLE RESISTOR	[M]
		SWITCHES	
S1	RSP2D015-A	SW, POWER	[M]
S201	RSP2B022-A	SW, INPUT SELECTOR	[M]
		COILS & TRANSFORMERS	
T601	RTP1J4E001-V	TRANSFORMER	[M] ⚠
		EARTH TERMINAL	
E1	SNE1004-2	EARTH TERMINAL	[M]
		JACKS	
JK1	SJF3069N	JK, LINE IN	[M]
JK2	SJF3069N	JK, LINE IN	[M]
JK601	SJS9236-1	JK, AC INLET	[M] ⚠
		PACKING MATERIALS	
P1	RPG3430	PACKING CASE	[M]E
P1	RPG3431	PACKING CASE	[M]EB
P1	RPG3623	PACKING CASE	[M]EG
P2	SPPK51	MIRAMAT BAG	[M]
P3	SPSK121-1	POLYFOAM (L)	[M]
P4	SPSK122-2	POLYFOAM (R)	[M]
		ACCESSORIES	
A1	RJA0019-2A	AC CORD ⚠	[M]EG E
A1	RJA0038-U	AC CORD ⚠	[M]EB
A2	RJL2P004B08	STEREO CABLE	[M]
A3	RFKSHGE50EBK	INST'L MANUAL ASS'Y	[M]EG
A3	RFKSHGE50EK	INST'L MANUAL ASS'Y	[M]E
A3	RQT3904-B	O/I BOOK	[M]EB

■ Resistors & Capacitors

Notes : * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors),etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
* Capacitor values are in microfarad (μF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistors values are in ohms, unless specified otherwise, 1k=1,000(OHM), 1M=1,000k(OHM)

Ref No.	Part No.	Values & Remarks
	RESISTORS	
R1	ERDS2TJ104T	100K 1/4W [M]
R2	ERDS2TJ104T	100K 1/4W [M]
R3	ERDS2TJ222T	2.2K 1/4W [M]
R4	ERDS2TJ222T	2.2K 1/4W [M]
R5	ERDS2TJ332T	3.3K 1/4W [M]
R6	ERDS2TJ332T	3.3K 1/4W [M]
R7	ERDS2TJ102T	1K 1/4W [M]
R8	ERDS2TJ102T	1K 1/4W [M]
R9	ERDS2TJ102T	1K 1/4W [M]
R10	ERDS2TJ102T	1K 1/4W [M]
R11	ERDS2TJ104T	100K 1/4W [M]
R12	ERDS2TJ104T	100K 1/4W [M]
R13	ERDS2TJ473T	47K 1/4W [M]
R14	ERDS2TJ473T	47K 1/4W [M]
R15	ERDS2TJ104T	100K 1/4W [M]
R16	ERDS2TJ104T	100K 1/4W [M]
R17	ERDS2TJ103T	10K 1/4W [M]
R18	ERDS2TJ103T	10K 1/4W [M]
R19	ERDS2TJ104T	100K 1/4W [M]
R20	ERDS2TJ104T	100K 1/4W [M]
R201	ERDS2TJ222T	2.2K 1/4W [M]
R202	ERDS2TJ222T	2.2K 1/4W [M]
R203	ERDS2TJ272T	2.7K 1/4W [M]
R204	ERDS2TJ272T	2.7K 1/4W [M]
R211	ERDS2TJ681T	680 1/4W [M]
R213	ERDS2TJ821T	820 1/4W [M]
R214	ERDS2TJ821T	820 1/4W [M]
R215	ERDS2TJ821T	820 1/4W [M]
R216	ERDS2TJ821T	820 1/4W [M]
R217	ERDS2TJ681T	680 1/4W [M]
R218	ERDS2TJ681T	680 1/4W [M]
R219	ERDS2TJ681T	680 1/4W [M]
R220	ERDS2TJ681T	680 1/4W [M]
R221	ERDS2TJ561T	560 1/4W [M]
R222	ERDS2TJ561T	560 1/4W [M]
R223	ERDS2TJ103T	10K 1/4W [M]
R224	ERDS2TJ103T	10K 1/4W [M]
R225	ERDS2TJ222T	2.2K 1/4W [M]
R226	ERDS2TJ222T	2.2K 1/4W [M]
R227	ERDS2TJ472T	4.7K 1/4W [M]
R228	ERDS2TJ472T	4.7K 1/4W [M]
R229	ERDS2TJ681T	680 1/4W [M]
R230	ERDS2TJ681T	680 1/4W [M]
R231	ERDS1FVJ560T ⚠	56 1/2W [M]
R232	ERDS2TJ473T	47K 1/4W [M]
R233	ERDS2TJ472T	4.7K 1/4W [M]
R236	ERDS2TJ333T	33K 1/4W [M]
R601	ERDS2TJ101T	100 1/4W [M]
R602	ERDS2TJ471T	470 1/4W [M]
R603	ERD2FCVG100T	10 1/4W [M]
R604	ERG2ANJP221H ⚠	220 2W [M]
R605	ERDS2TJ562T	5.6K 1/4W [M]
R606	ERDS2TJ222T	2.2K 1/4W [M]
R607	ERDS2TJ472T	4.7K 1/4W [M]
R608	ERDS2TJ473T	47K 1/4W [M]
R609	ERDS2TJ273T	27K 1/4W [M]
R610	ERDS2TJ103T	10K 1/4W [M]
R611	ERDS2TJ224T	220K 1/4W [M]
	CAPACITORS	
C1	ECBT1H101KB5	100P 50V [M]
C2	ECBT1H101KB5	100P 50V [M]
C3	ECBT1H101KB5	100P 50V [M]
C4	ECBT1H101KB5	100P 50V [M]
C5	ECBT1H101KB5	100P 50V [M]
C6	ECBT1H101KB5	100P 50V [M]
C7	ECBT1H101KB5	100P 50V [M]
C8	ECBT1H101KB5	100P 50V [M]
C9	ECEA1EKA4R7B	4.7 25V [M]
C10	ECEA1EKA4R7B	4.7 25V [M]
C11	ECEA1EKA4R7B	4.7 25V [M]
C12	ECEA1EKA4R7B	4.7 25V [M]
C13	ECCR1H101K5	100P 50V [M]
C14	ECCR1H101K5	100P 50V [M]
C15	ECFR1E123KR	0.012 25V [M]
C16	ECBT1E103ZF5	0.01 25V [M]
C17	ECBT1E103ZF5	0.01 25V [M]
C201	ECBT1H471KB5	470P 50V [M]
C202	ECBT1H471KB5	470P 50V [M]
C203	ECEA1HKA3R3B	3.3 50V [M]
C204	ECEA1HKA3R3B	3.3 50V [M]
C205	ECQV1H683JM3	0.068 50V [M]
C206	ECQV1H683JM3	0.068 50V [M]
C207	ECEA1HKA010B	1 50V [M]
C208	ECEA1HKA010B	1 50V [M]
C209	ECFR1E333KR	0.033 25V [M]
C210	ECFR1E333KR	0.033 25V [M]
C211	ECEA1HKAR47B	0.47 50V [M]
C212	ECEA1HKAR47B	0.47 50V [M]
C213	ECFR1E123KR	0.012 25V [M]
C214	ECFR1E123KR	0.012 25V [M]
C215	ECEA1HKAR22B	0.22 50V [M]
C216	ECEA1HKAR22B	0.22 50V [M]
C217	ECBT1C392KR5	3900P 16V [M]
C218	ECBT1C392KR5	3900P 16V [M]
C219	ECQV1H683JM3	0.068 50V [M]
C220	ECQV1H683JM3	0.068 50V [M]
C221	ECBT1C182KR5	1800P 16V [M]
C222	ECBT1C182KR5	1800P 16V [M]
C223	ECFR1E333KR	0.033 25V [M]
C224	ECFR1E333KR	0.033 25V [M]
C225	ECBT1H681KB5	680P 50V [M]
C226	ECBT1H681KB5	680P 50V [M]
C227	ECFR1E123KR	0.012 25V [M]
C228	ECFR1E123KR	0.012 25V [M]
C229	ECBT1H331KB5	330P 50V [M]
C230	ECBT1H331KB5	330P 50V [M]
C235	ECEA0JKA331Q	330 6.3V [M]
C241	ECEA1CKA100B	10 16V [M]
C242	ECEA1CKA100B	10 16V [M]
C243	ECEA1EKA4R7B	4.7 25V [M]
C244	ECEA1EKA4R7B	4.7 25V [M]
C601	ECBT1E103ZF5	0.01 25V [M]
C602	ECBT1E103ZF5	0.01 25V [M]
C603	ECEA1CKA100B	10 16V [M]
C604	ECEA1CKA100B	10 16V [M]
C605	ECA1VM221B	220 35V [M]
C606	ECA1VM221B	220 35V [M]
C607	ECBT1E103ZF5	0.01 25V [M]
C608	ECKR2H682PE	6800P 500V [M]
C609	ECA1VM101B	100 35V [M]
C610	ECEA1EKA4R7B	4.7 25V [M]
C611	ECEA0JKA101B	100 6.3V [M]

Ref No.	Part No.	Values & Remarks